

AU/ACSC/39-1157/2005-2006

AIR COMMAND AND STAFF COLLEGE

AIR UNIVERSITY

Effects-Based Operations:
Air Power as the Sole Military Instrument of Power,
Has it Matured Enough?

by

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A Research Report Submitted to the Faculty

In Partial Fulfillment of the Graduation Requirements

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Maxwell Air Force Base, Alabama

April 2006

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE APR 2006		2. REPORT TYPE		3. DATES COVERED 00-00-2006 to 00-00-2006	
4. TITLE AND SUBTITLE Effects-Based Operations: Air Power as the Sole Military Instrument of Power, Has it Matured Enough?				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Air University Press (AUL/LP),131 W Shumacher Avenue,Maxwell AFB,AL,36112-6615				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 49	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

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Preface

Operations Allied Force and Enduring Freedom are the only combat operations the Royal Danish Air Force has ever participated in with combat aircraft (F-16). The general perception is that the operations were highly successful for, and because of, the application of air power.

The Danish Armed Forces are not joint within the national structure in spite of their small size. The philosophy is that jointness is achieved through combined operations. Each service has small, but, numerous internationally deployable assets. Consequently, these assets will always be part of a larger international contribution; thus the combined aspect will ensure jointness within the national structure.

The Royal Danish Air Force has identified the US Air Force as its primary partner. The Danish philosophy of jointness through combined operations has resulted in a very air-centric way of perceiving operations within the Royal Danish Air Force because of the lack of influence from other services. By examining Effects-Based Operations through case studies of operations Allied Force and Enduring Freedom, I hope to present a different case to my fellow Danish Air Force colleagues than the general perception. Air power is not a military instrument of power to be used alone, but very dependent on support from other services and branches.

Finally, I expect my research for this paper to be valuable in my next assignment. After successful completion of the Air Command and Staff College, I am assigned to the Expeditionary Air Staff as a part of the A3 (operations) cell. I will be heavily involved in planning and execution of air operations, primarily with our American partners. This will no doubt require a profound understanding of the capabilities and limitations of air power as well as an appreciation for the joint environment.

Effects-Based Operations:

Air Power as the Sole Military Instrument of Power, Has it Matured Enough?

INTRODUCTION

Effects-Based Operations (EBO) has been a buzzword and a part of Air Force lingo since the overwhelming success of the air campaign in Operation Desert Storm in 1991. Even though EBO was not coined in military operational terms until the last decade of the twentieth century, thinking in effects has existed in the military trade for ages.¹ One need only look at the early doctrine of strategic bombing from the Air Corps Tactical School that later evolved into the final American air plan for World War II. The plan, called AWPD-42, stated that the destruction of German military and industrial assets would have the effect of destroying the German war machine.²

Within the last two decades, technology has reached a level that has shifted the perception of EBO to a more practical utilization than mere thoughts on paper.³ Air power and technology have always been close, thus it is no surprise that air power advocates embrace the concept of EBO. To the air power advocate, operations like Desert Storm, Deliberate Force, Allied Force (OAF), and Enduring Freedom (OEF) all confirm the effectiveness of air power. Some might even claim that air power is the only military tool necessary to conduct EBO, pointing to the previous mentioned operations as proof.⁴

EBO is, of course, not only about air power. Joint Forces Command's (JFCOM) definition of EBO⁵ describes how "...the integrated application of selected instruments of power..." forms the basis of EBO. The instruments of power (IOP) are then utilized to achieve second-order effects at the strategic and operational level of war.⁶ Air Force Doctrine Document

(AFDD) 2 defines effects at the strategic level of war as “... destruction or disruption of enemy center(s) of gravity (CoGs) or other vital target sets, including command elements, war production assets, and key supporting infrastructure that impairs the enemy’s ability or will to wage war or carry out aggressive activity.” AFDD 2 goes on to define effects at the operational level of war as “...theater air superiority, command and control (C2) decapitation, and battlefield isolation...” in support of the overall strategy.⁷

The purpose of this paper is to examine the role of air power as the military IOP when conducting EBO. Has the revolution in military affairs (RMA) enabled air power to achieve second order effects at the strategic and operational level on its own? Initially, the paper will capture how well-known thinkers and air power theorists have advocated an effects-based approach through time, thus proving that thinking in effects (EBO) is nothing new.

Second, this paper will examine OAF and OEF by using thought, technology, and organization as areas for critical analysis.⁸ Even though OAF and OEF were different in nature, distinct similarities like the state of available technology, a crucial need for intelligence, and centralized command relations that contradicts joint doctrine, are common to both operations.

This paper concludes, based on the case studies of OAF and OEF, that air power is not capable of achieving second-order effects at the strategic level or operational level on its own. The conclusion discusses the status of air power as the military IOP in relation to conducting successful EBO and revolves around the three areas used for critical analysis. The case studies of OAF and OEF revealed interdependence between each of these three areas, thought, technology, and organization, in relation to conducting EBO successfully.

HISTORICAL BACKGROUND

He who controls the past, controls the future; and he who controls the present, controls the past.

— George Orwell

In order to enhance the comprehension of EBO and how it has affected the employment of air power through time, it is necessary to spend a few moments studying history. This chapter will address how well-known thinkers and air power theorists have been thinking about effects rather than mere destruction.

The Age of Total War

EBO is not a new revelation in warfare; it is, in fact, older than air power itself. In the early nineteenth century, Antoine-Henri Jomini and Carl von Clausewitz each had their own perception of warfare and associated terms that one could interpret as an effects-based approach.

Jomini looked upon warfare as a science controlled by scientific principles united through strategy.⁹ Jomini's approach to warfare was very simple and revolved around decisive points (DP). He defined a DP as "...a point whose attack or capture would imperil or seriously weaken the enemy."¹⁰ By using mass and maneuver, Jomini would use all available forces to attack a fraction of the enemy forces defending the DP.¹¹ DPs would be objects of direct military importance like supply lines, exposed flanks of the enemy, or vital river crossings.¹²

Clausewitz believed that warfare was an art and encapsulated EBO with his definition of a Center of Gravity (CoG). He defined a CoG as "...the hub of all power and movement...".¹³ In contrast to Jomini's definition of DP, Clausewitz proceeded beyond the military realm by identifying the capital (representing the will of the people) and allies (the political aspect) as possible CoGs.¹⁴ Additionally, Clausewitz realized that CoGs only exist in relation to objectives and may

change when adversaries change. The CoG is the point at which all one's energy must be aimed in order to impose one's will on the enemy.¹⁵ Clausewitz mainly focused on using CoGs as an analytical tool to analyze one's adversary's and one's own weaknesses.

During the interwar period, air power theorists like Giulio Douhet and William "Billy" Mitchell developed ideas about air power's role in EBO. Both wanted to avoid the devastating trench warfare experienced in World War I and envisioned the use of air power to achieve operational and strategic effects.

Douhet developed a Jominian approach that would mass bomber aircraft against an enemy's DP. However, Douhet believed that bombing of enemy population centers ultimately would result in a greater effect than neutralizing enemy forces and their logistics directly. Victory would come in breaking the enemy's will to fight by breaking his morale, hence, there was a need to bomb civilian population centers.¹⁶

Mitchell also believed in bombing to achieve the desired effect of breaking the enemy's will to fight. Unlike Douhet, he did not believe in bombing the population to achieve this, but identified the enemy's economy, industry and transportation as CoGs.¹⁷ However, most industry was located in population centers, which meant that in reality population centers would still be bombed because of an insufficient level of technology that allowed precise bombing.

Air Corps Tactical School (ACTS), established in 1920, was a locus of firm believers in the potential of air power to conduct EBO. Confidence in overrated emerging technology made ACTS conclude that air power could destroy the enemy's ability to wage war by penetrating any known air defenses and destroy enemy industries.¹⁸ This evolved into the doctrine of high altitude precision daylight bombing (HAPDB), which dominated US bombing doctrine until the end of the Vietnam War.

The Modern Era

In 1989, Col John A. Warden III proposed a way of translating strategic military objectives into a theater air campaign in his book *The Air Campaign: Planning for Combat*.¹⁹ Based on the book, he established a model of systems thinking, with the enemy system pictured as a five-ring model. From the center outward, the rings are leadership, organic essentials, infrastructure, population, and the fighting mechanism.²⁰ The rings are organized in order of importance to functioning of the the overall system, with leadership being the most important and the fighting mechanism the least important.

Warden used an analogy of the human body when explaining the five-ring model. The body can't function without the brain—represented by the center ring (leadership). Vice versa, if an opponent neutralizes the body's organic essentials (food/water), infrastructure (vascular system), population (cells), and fighting mechanism (white blood cells) this will paralyze the brain.²¹

Warden aimed at achieving strategic paralysis with the use of air power by targeting CoGs within the five rings. Ideally, the CoGs are located in the center ring, aimed directly at the leadership. However, if these target sets are unavailable, Warden suggested the indirect method of targeting CoGs within the other four rings to put pressure, that might also result in paralysis, on the leadership.²²

In his 1996 book, *Bombing to Win*, Robert A. Pape examined 33 bombing campaigns through time to study the coercive effects of air power. He divided coercive air power into three main categories: punishment²³, denial, and decapitation.²⁴ The first, punishment, attempts to coerce the enemy by inflicting pain on the civilian population. The next, denial, seeks to thwart the enemy's military strategy by destroying military forces and support structure directly related

to the forces. Lastly, decapitation captures the essence of Warden's air power theory by targeting key leadership and command and control assets to defeat the enemy.

Pape dismisses punishment and decapitation as ineffective methods for coercion using air power. In wartime, Pape claims, backed up by history, that bombing the civilian population to coerce an enemy will have the opposite effect. Furthermore, Pape argues that decapitation is too hard because political leaders are too difficult to locate and target. Additionally, there is no guarantee as to who is going to replace them in the case of successful decapitation.

Pape concludes that denial and not punishment or decapitation will provide the critical leverage in conventional coercion.²⁵ Moreover, denial is not a task for conventional strategic bombing but for counterland operations at the operational level of war supporting a credible ground force. By denying the enemy the possibility of achieving his objectives, Pape argues that the costs of conflict will become intolerable.²⁶

Lt. Gen. David A. Deptula is a practitioner and a scholar of Warden's air power theory. Deptula emphasizes the effects-based approach as opposed to mere destruction, which he believes is only a means of achieving the desired effect. Deptula perceives technological innovations like stealth and precision-guided munitions (PGM) as a substitute for mass, and in 2001 even suggested a draw down of conventional land and sea forces because of air power's ability to project power.²⁷ Finally, Deptula recognizes the critical requirement for adequate intelligence analysis of one's opponent in order to conduct successful EBO.²⁸

OPERATION ALLIED FORCE

Politics is war without bloodshed while war is politics with bloodshed.

— Mao Tse-tung

The short recap of history in the previous section clearly shows that thinking about effects in warfare is not a new concept. Every thinker and theorist has a slightly different perspective on EBO, to use the current term, but they all tend to favor control of the enemy through EBO rather than physical destruction for its own sake. Operation Allied Force (OAF) was a response in 1999 by the North Atlantic Treaty Organisation (NATO) to the atrocities committed by Former Republic of Yugoslavia (FRY)²⁹ forces against ethnic Albanians in Kosovo. Since the end of World War II, OAF was the largest military operation in Europe and first time NATO used military force.³⁰

Historical Context

NATO had three interests at stake in Kosovo. First, Serbian aggression threatened to destabilize the Balkans. Second, the humanitarian atrocities in Kosovo committed by FRY forces, put immense pressure on the infrastructure in neighboring countries and threatened to fracture NATO. Last, Milosevic challenged NATO's credibility by ignoring the peace agreements made in 1998 with the Organization for Security and Cooperation (OSCE) and monitored by NATO.³¹

Representatives from France, Germany, Russia, the United Kingdom, and the United States had tried to settle the Kosovo crisis between Serbia and the Kosovo Liberation Army (KLA) by negotiations in February and March 1999.³² OAF began 24 March 1999, when negotiations failed and Serbia increased the number of its armed forces in the Kosovo area.

In a televised national address, US President William J. Clinton stated the mission of the 19 NATO allies:

Our mission is clear -- to demonstrate the seriousness of NATO's purpose so that the Serbian leaders understand the imperative of reversing course, to deter an even bloodier offensive against innocent civilians in Kosovo and, if necessary, to seriously damage the Serbian military's capacity to harm the people of Kosovo.³³

In the same address, President Clinton refused to commit US forces to a ground campaign,³⁴ and thereby indirectly ruled out the possibility of a credible NATO ground campaign.

Not until an extraordinary meeting of the North Atlantic Council on 12 April 1999, did NATO set demands for President Milosevic in order to stop OAF:

1. Ensure a verifiable stop to all military action and the immediate ending of violence and repression;
2. Ensure the withdrawal from Kosovo of the military, police and paramilitary forces;
3. Agree to the stationing in Kosovo of an international military presence;
4. Agree to the unconditional and safe return of all refugees and displaced persons and unhindered access to them by humanitarian aid organisations;
5. Provide credible assurance of his willingness to work on the basis of the Rambouillet Accords in the establishment of a political framework agreement for Kosovo in conformity with international law and the Charter of the United Nations.³⁵

With no NATO ground campaign in OAF, air power alone had to achieve the military objectives as stated by President Clinton and NATO. The success of air power in Operation Desert Storm and Deliberate Force had the unfortunate effect of presenting air power as a quick solution that would avoid a lengthy conflict.³⁶

Thought

NATO's military plan for OAF was one of coercive air power with the purpose of inflicting enough pain to force Milosevic to the negotiating table and withdraw from Kosovo. Initially, the first phase would be suppression of enemy air defense (SEAD) missions against Serbian in-

tegrated air defense systems (IADS), as well as precision strikes against fixed army installations. Second, phase two would see attacks of mainly military targets south of Belgrade. Lastly, the third phase aimed at attacking military targets in the northern part of Serbia and targets in Belgrade.³⁷ The air campaign was sequential, with a plan to slowly increase pressure on Serbia. This resembled Operation Rolling Thunder in Vietnam that had lasted approximately four years in the 1960s.³⁸ NATO hoped that merely demonstrating resolve would make Milosevic comply within a couple of days.³⁹

The two main decision-makers on NATO's side in the air campaign, advocated two different air power theories in seeking the desired effects. The Supreme Allied Commander Europe (SACEUR), Gen Wesley K. Clark, believed in targeting individual Serbian military units threatening the ethnic Albanians in Kosovo.⁴⁰ Such an approach resembled the denial strategy discussed by Pape, that seeks to deprive the enemy of options to achieve his military strategy.

However, the lack of a NATO ground threat was in direct contradiction to Pape's denial strategy, that called for the use of air power in support of ground operations.⁴¹ Serbian forces were scattered throughout Serbia and Kosovo, thus extremely difficult to locate and target effectively without a ground threat.

The Combined Force Air Component Commander (CFACC), Lt. Gen. Michael C. Short, favored targeting the Serbian leadership responsible for orchestrating the ethnic cleansing in Kosovo. This is the essence of Warden's systems theory and the center of his five-ring model that was used for planning the air campaign of Operation Desert Storm.⁴² Pape calls this type of coercive air power decapitation and argues that it historically has been ineffective.

For decapitation to be successful it is vital that the campaign planning be focused on targeting the CoGs that are likely to cause the Serbian leadership to respond as desired, in this case

to withdraw from Kosovo. Furthermore, campaign planning and intelligence sources must identify, which targets affect the CoGs in order to build a valid and thorough target list.⁴³ Without clear military objectives from NATO and the absence of a credible ground force, NATO air power's chance of success was limited.

The air campaign in OAF utilized elements of the denial approach as well as the decapitation approach throughout the 78 days it lasted. NATO planners made a fundamental flaw in planning by underestimating the importance of Kosovo to the Serbs. It took more than a little effort to force them out of Kosovo. Additionally, the lack of a NATO ground threat and insufficient intelligence preparation of the battlefield (IPB) rendered both approaches ineffective.⁴⁴

Technology

OAF introduced new technologies to air power that gave the commanders a new range of options, but at the same time resulted in more constraints on the use of air power. The B-2 Spirit stealth bomber finally made it possible for a heavy bomber to penetrate air defenses as ACTS had envisioned more than 60 years earlier. However, only nine B-2's were available for OAF and only six of those were used for combat operations.⁴⁵

The B-2's are a vital strategic asset for the US and therefore kept at a CONUS location (Whiteman AFB, MO) even when employed in operations like OAF. This resulted in 28-32 hour missions and a need for a flexible targeting system (airborne targeting), as several targets only were approved a couple of hours before the planned time over target. During the 78-day air campaign, the B-2's conducted 49 combat sorties, on average a two-ship formation every four days. This was a result of low availability (six aircraft) and extremely long missions due to domestic basing.

In addition to the introduction of the B-2 stealth bomber, the US fielded a new generation of PGM. The joint direct attack munition (JDAM) made all-weather bombing possible by utilizing the satellite based global positioning system (GPS) for guidance. The JDAM, a conventional 2,000 pound munition guided by an 18,000\$ GPS tail kit, is an inexpensive alternative to a Tomahawk land attack missile (TLAM) or a conventional air-launched cruise missile (CALCM). An all-weather bombing capability was much needed, as bad weather in the area severely hampered air operations. Out of the 78 days OAF lasted, only 24 days allowed unimpeded air strikes.⁴⁶ Unfortunately, The B-2 was the only aircraft in the US inventory that could deliver JDAMs, thus limiting the availability off all-weather bombings to B-2 missions planned up to two days in advance.⁴⁷

OAF saw an unprecedented use of unmanned aerial vehicles (UAV), and their success was publicly recognized. The US (all services), United Kingdom, Germany, and France all employed UAVs throughout the air campaign, with the RQ-1 Predator being the most well known.⁴⁸ The UAVs were primarily used for surveillance and reconnaissance, and to perform near-real time battle damage assessment (BDA).⁴⁹ While used as effective intelligence, surveillance, and reconnaissance (ISR) assets, the UAVs were integrated into the forward air control system to provide cueing of Serbian military assets to allied weapons platforms.⁵⁰

The success of the UAVs in OAF caused the US Secretary of Defense William S. Cohen to issue a directive that called for a stronger commitment towards UAVs. As a direct result, the Predator entered full-scale production, and the USAF planned the fielding of the advanced high-altitude endurance UAV named RQ-4 Global Hawk.⁵¹

In general, the introduction of a stealth bomber, PGMs, and improved ISR platforms resulted in greater accuracy in weapons delivery. Greater accuracy allowed NATO to practice an

economy of force, put fewer people at risk, and reduced the number of errors and the chance of unintended damage.⁵²

On the flipside, better accuracy also caused the politicians and public opinion to have greater expectations of no collateral damage. The presence of more accurate munitions gave the misconception of air power being able to conduct a perfect war without errors.⁵³ Therefore, it took only three significant errors⁵⁴ to impose severe political restraints on the air campaign in Kosovo. Some NATO allies delivered lists of off-limit targets to the NATO commander, with a rationale that improved accuracy in hitting targets also had to mean improved ability to avoid specific targets. This restrained the air campaign during OAF even more.⁵⁵

For example, French President Jacques Chirac would not approve of any attacks against Belgrade's electrical power grid that would physically destroy it.⁵⁶ By focusing on the desired effect, US planners came up with the idea of using the CBU-94 to shortcut the power grid by dispensing carbon-graphite threads on to it.⁵⁷ Nevertheless, this episode is probably the only positive outcome of the many restrictions imposed by the political leadership on the air campaign during AOF.

Organization

OAF was an operation in NATO's southern region, which normally would mean that the Commander in Chief Allied Forces Southern Europe (CINCSOUTH), Admiral James O. Ellis Jr., and his air commander (COMAIRSOUTH), Lt. Gen. Short, would have been in charge of the operation, just as in Operation Deliberate Force in 1995.⁵⁸ Nevertheless, Gen Clark took command of the operation, and in particular the air campaign during OAF. Thereby, Gen Clark removed CINCSOUTH from the chain of command by giving orders directly to Lt. Gen. Short,

who was the CFACC. However, Lt. Gen. Short still had to report back to CINCSOUTH and not directly to SACEUR.⁵⁹

OAF also witnessed combined command structures. The NATO command structure went from the political leadership at the North Atlantic Council (NAC) to SACEUR and then to his regional commander (CINCSOUTH) and his subordinate commanders—with the above mentioned caveats. Parallel to the NATO command structure, every nation has its national command structure. The combined structures created confusion,⁶⁰ complicated planning, and violated the principle of unity of command.⁶¹

The combined command structure resulted in an extensive targeting process as every NATO country had a different political agenda.⁶² NATO implemented procedures for delegating target approval authority to military commanders during OAF,⁶³ but several targets still had to get approval by a unanimous NAC. This severely complicated target approval, as some NATO countries would not approve of one target, others would not allow targets to be hit by attacks launched from their countries, and yet others would not strike certain targets themselves but would allow other NATO countries to do it.⁶⁴

On the operational level, the combined air operation center (CAOC) in Vicenza, Italy, was responsible for command and control of air operations. However, the previously described NATO expectations of an early surrender by Milosevic had left the CAOC understaffed.⁶⁵ This hampered vital areas within the CAOC like planning and battle damage assessment. Inadequate staffing and a targeting process that required political approval meant that the CAOC could not use a consistent targeting strategy until day 47 of the air campaign as this was the first day a Joint Integrated Prioritized Target List (JIPTL) was produced. Until then, targets had been se-

lected based on which targets from the Master Air Attack Plan (MAAP) had received political approval.⁶⁶

OAF saw the first extensive use of video teleconferencing as a tool for command and control that spanned the entire spectrum from the strategic level to the tactical level. In the 2000 DoD after-action report to the US Congress, this interaction from the strategic level directly to the tactical level is described as having positive as well as “challenging” aspects—the politically correct term for a negative aspect.⁶⁷ On the positive side, video teleconferencing allowed for speedy coordination between commanders and key personnel, while the challenge was to ensure dissemination of essential information to key personnel not attending the conference.⁶⁸

Last, OAF revealed a lack of interoperability and common doctrine among the participating NATO forces as well as internally among the services of the largest force provider in AOF—the United States. This is clearly stated in the DoD after-action report to the US Congress, “Operation Allied Force underscores the criticality of joint doctrine, interoperability training, and supporting Service doctrine, tactics, techniques, and procedures.”⁶⁹

Conclusion Operation Allied Force

In the end, Milosevic agreed to an end of hostilities and signed an agreement on 9 June 1999 that laid out the terms for a cessation of hostilities, withdrawal of FRY forces from Kosovo, and the insertion of an international security force (KFOR).⁷⁰

Did air power play a role in bringing Serbia’s leader Milosevic to the negotiating table? One could argue that it did, as the air campaign was inflicting serious damage to Serbia’s economy after phase three was initiated.⁷¹ On the other hand, the absence of a ground threat resulted in dispersed FRY forces that was more difficult for air power to locate and target. Moreover, the

deployment of 25,000 NATO troops to the region and the inability for Serbia to gain political backing from Russia most likely contributed to Milosevic's capitulation.⁷² In sum, air power had an important but complementary role in conducting EBO during OAF. The synergy of air power, a presence of NATO ground forces, and Serbian political solitude are all to credit for the overall success.⁷³

OAF was a success for NATO, but did the campaign meet the objectives and demands stated by President Bill Clinton and the NAC? NATO demonstrated resolve as the air campaign went on for 78 days in spite of the initial lack of results. However, FRY forces stepped up the offensive in Kosovo when the air campaign started—a failure for deterrence.⁷⁴ Furthermore, NATO never degraded Serbian military capacity seriously as most units were scattered all over Serbia and Kosovo comprising numerous targets that were extremely difficult to locate and destroy.⁷⁵

Turning to the NATO objectives, NATO secured a withdrawal of FRY forces from Kosovo and an insertion of KFOR to keep the peace and ensure a safe return of refugees. Finally, NATO stopped FRY military action and violence in the end, even though the intervention initially had the opposite effect, as described in the previous paragraph. In sum, air power contributed in achieving second order effects at the operational level; but in general, OAF was an exercise in coercive diplomacy, in which the military IOP was just one of the tools utilized to resolve the conflict.

OPERATION ENDURING FREEDOM

I know war as few other men now living know it, and nothing to me is more revolting. I have long advocated its complete abolition, as its very destructiveness on both friend and foe has rendered it useless as a method of settling international disputes.

— Douglas MacArthur

Planning and execution of Operation Enduring Freedom (OEF) happened in the wake of the terrorist attacks of 11 September 2001 as a direct response to the people responsible, Al Qaeda, and their supporters, the Taliban rulers of Afghanistan.

Historical Context

Prior to OEF, there was no existing operational plan (OPLAN) ready to update and modify for an operation in Afghanistan against Al Qaeda and the Taliban.⁷⁶ Central Command (CENTCOM) wanted months to build a credible ground force in theater before engaging in an operation in Afghanistan. However, Secretary of Defense Rumsfeld made it clear that they did not have months; they should think in days and weeks, instead.⁷⁷

CENTCOM came up with a new plan that relied on air power and a smaller amount of ground forces, depending on the actual need. In contrast to OAF, a ground option was not ruled out beforehand. In fact, during the planning of OEF, Secretary Rumsfeld underlined the importance of a ground option. President Bush reaffirmed this in an address to a special joint session of Congress on 20 September 2001, in which he said:

It [OEF] will not look like the air war over Kosovo two years ago, where no ground troops were used and not a single American was lost in combat. Our response involves far more than instant retaliation and isolated strikes.⁷⁸

Secretary Rumsfeld outlined the military objectives of OEF as the following:

- To make clear to the Taliban leaders and their supporters that harboring terrorists is unacceptable and carries a price;

- To acquire intelligence to facilitate future operations against al Qaeda and the Taliban regime that harbors the terrorists;
- To develop relationships with groups in Afghanistan that oppose the Taliban regime and the foreign terrorists that they support;
- To make it increasingly difficult for the terrorists to use Afghanistan freely as a base of operation;
- To alter the military balance over time by denying to the Taliban the offensive systems that hamper the progress of the various opposition forces; and
- To provide humanitarian relief to Afghans suffering truly oppressive living conditions under the Taliban regime.⁷⁹

Within weeks after 11 September 2001, the US government had formed a coalition, established the framework of a suitable strategy, ensured basing rights and necessary diplomatic rights for positioning forces, deployed forces and material, and negotiated alliances with local Afghan forces like the Northern Alliance.⁸⁰ The operation began on 7 October 2001.

Thought

CENTCOM and the CAOC at Prince Sultan Air Base in Saudi Arabia had very different perspectives on how to orchestrate the air campaign in OEF. CENTCOM had an attrition-based approach and wanted air power to physically destroy all known enemy ground and air assets.⁸¹ The CAOC wanted to use air power in direct pursuit of the overall goals of OEF by denying the enemy the freedom to operate.⁸²

Deptula was the CAOC director at the start of OEF, and he was most likely one of the driving forces behind the CAOC's approach. The idea was to use air power to achieve the campaign objectives in the fastest way possible, spending the least amount of effort. By using a mixture of denial and decapitation operations, the CAOC wanted only to neutralize target sets when such neutralization directly supported the overall campaign objectives. The CAOC's definition of "neutralize" might include physical destruction, but was not limited to it.

CENTCOM applied a targeteering approach to OEF and insisted on the physical destruction of all known enemy assets, not relating this to the overall campaign objectives.⁸³ Moreover, CENTCOM intelligence staff required imagery on targets for battle damage assessment (BDA). If timely imagery was not available, a target would not be classified as neutralized, even if the desired effect had been achieved.⁸⁴ Such an approach is attritional, and a waste of time and effort, because of the disconnect between the overall campaign objectives and the related target sets.⁸⁵

OEF was a mission under CENTCOM responsibility; hence, CENTCOM chose the operational approach to applying air power, as described above. In spite of a less than efficient choice of air campaign, one lesson had been learned from OAF. At no point did the US rule out an allied ground campaign, which greatly enhanced the effectiveness of air power.⁸⁶ The coalition utilized local Afghan forces, like the Northern Alliance, as ground forces in the absence of a larger coalition land component. This caused the Taliban to mass their forces in defense of key points, thus making ideal targets for air power.⁸⁷ On that note, OEF proves Pape's point of air power's effectiveness in counterland operations in support of a ground force and even suggests the effectiveness of ground forces in support of air power.⁸⁸

Technology

Even though OEF occurred less than three years after OAF, technological development within DoD had continued at a rapid pace, thus making new capabilities available. New technology was fielded to counter the enemy's use of sanctuary. Moreover, OEF continued to exploit successful technologies from OAF and utilized or integrated old technology in new, innovative ways.

During OEF, enemy soldiers from Al Qaeda and Taliban used hideouts in mountain caves. These caves were located in areas like Tora Bora, in the northeastern part of Afghanistan that holds thousands of caves of various sizes. Initially, allied forces had no way to counter this but to send special operations forces (SOF) into the caves to attack the enemy. The SOF approach was extremely dangerous and very time consuming because of the large number of caves. Consequently, two new types of weapons were rapidly developed. A conventional earth-penetrator weapon that made it possible to penetrate the caves,⁸⁹ and a thermobaric weapon which creates a high overpressure in the cave upon impact.⁹⁰

The JDAM, introduced during OAF as a B-2 only weapon, was now available on the B-1 and B-52, as well.⁹¹ PGMs were the preferred weapon of choice and accounted for 60% of the overall use of munitions in OEF—the highest percentage in any conflict until that time.⁹²

The use of UAVs expanded further during OEF, and like PGMs reached an all-time high in terms of usage.⁹³ The RQ-4 Global Hawk was still undergoing testing, but nevertheless was employed in support of operations in OEF.⁹⁴ The presence of the Global Hawk in the area of responsibility (AOR) allowed for more precise targeting of weapons because of its superior capabilities as an ISR platform. OEF also saw the use of the MQ-1 Predator, which besides its ISR capabilities also had the capability of employing weapons at allocated targets.⁹⁵

UAVs with ISR capabilities were just one element in the theater-wide ISR umbrella that covered the entire OEF AOR.⁹⁶ Other examples of ISR assets used during OEF are E-3 AWACS, E-8 Joint Stars, U-2, RC-135 Rivet Joint, EA-6B Prowler, military photo-reconnaissance and radar-imaging satellites, and combat aircraft with targeting pods, like LANTIRN (Low-Altitude Navigation and Targeting Infrared for Night), TARPS (Tactical Aerial Reconnaissance Pod System), and Litening II. Not all ISR platforms were capable of communicat-

ing directly with each other, but had to relay data back to the CAOC at Prince Sultan Air Base in Saudi Arabia.⁹⁷ Besides the obvious advantages of having ISR capabilities cover the entire AOR continuously, this generated a huge demand for bandwidth and intelligence analysis.⁹⁸

Previously described improvements in technology, like networking and greater accuracy, played a vital role in making new and innovative ways of employing existing capabilities possible. In OEF, SOF were used as human intelligence (HUMINT) assets, providing vital information for planning air operations. Furthermore, SOF called in air support as forward air controllers (FAC), either acting in small groups of SOF or embedded with local Afghani troops like the Northern Alliance.⁹⁹ On many occasions, the B-52 Stratofortress responded to the SOF call for air support, performing close air support (CAS) or direct attack missions,¹⁰⁰ which were very different from its classic role as a long-range strategic bomber.

Other aircraft like the P-3 Orion maritime patrol aircraft and the KC-135 Stratotanker also assumed tasks beyond their usual mission set. The P-3 acted as an ISR provider by utilizing its link capability to bridge the network gap between SOF and the Predator UAVs.¹⁰¹ Additionally, some of the KC-135 aircraft received enhanced communication upgrades to act as relay platforms from the CAOC in Saudi Arabia to attack aircraft in the OEF AOR.¹⁰² Finally, carrier-based naval air was used extensively in support of operations in OEF, resulting in missions further away from the carrier battle groups than ever experienced before.¹⁰³ The distance to the OEF AOR and the lack of USAF tanker assets meant that the Navy had to refuel its own strike aircraft using other strike aircraft like the F/A-18 E/F Super Hornet.¹⁰⁴

Improvements in technology tightened the sensor-to-shooter loop and reduced the kill chain to minutes.¹⁰⁵ When technology enables a force to detect, identify, allocate, and engage a target within minutes, the constraint concerning EBO no longer resides in the capability of tech-

nology. In fact, OEF underlined the dependence on thorough intelligence and assessment, as was the case in OAF. Moreover, OEF brought focus to the decision-making element in the kill chain. It was no longer the inability of technology that caused a missed opportunity to strike a time-sensitive target. Political restraints on targeting¹⁰⁶ and the time needed to reach a decision on engaging were now the main cause of missed opportunities.¹⁰⁷

Organization

OEF fell under the responsibility of CENTCOM, with its headquarters (HQ) at MacDill Air Force Base in Florida. CENTCOM decided to run OEF from its HQ in Florida, using information technology to stay in contact with the AOR and the forward-deployed CAOC at Prince Sultan Air Base in Saudi Arabia. This separated the responsible HQ and the AOR by eight time zones.¹⁰⁸

From the very beginning of OEF, there was tension between CENTCOM and the CAOC.¹⁰⁹ Some of the tension originated from the difference in thought, as described earlier. Nevertheless, the physical separation of the joint force commander (JFC) and his air component commander also caused tension.

During OEF, CENTCOM, of course, remained responsible for the entire CENTCOM AOR. However, CENTCOM commander, Gen Tommy R. Franks, chose to be the JFC for OEF instead of appointing a specific theater commander (JFC). This was probably a major contributor to the decision to run OEF from CENTCOM HQ in Florida. A theater commander should be present in the region. If that's not possible, subordinate components ought to at least send a general officer to the JFC HQ¹¹⁰—neither was the case in OEF.¹¹¹

The basic principle of command and control in all western armed forces, including US, is centralized planning and decentralized execution. As Dr. Milan Vego wrote, they recognize that, “Decentralization of the decision-making process is a prerequisite for giving subordinates sufficient freedom of action.”¹¹² Radical advances in technology have made it possible for strategic level commanders to direct tactical level operations. Evidence from OEF suggests that the strategic level commanders have embraced this possibility, instead of using technology to reinforce decentralized command.¹¹³

OEF, like OAF, was witness to extensive target approval procedures. During OEF, the cause was not 19 different countries that needed to agree, but strict rules of engagement (ROE) imposed by Secretary Rumsfeld. Gen Franks, Secretary Rumsfeld, or both had to approve target selection and sensitive targets due to an emphasis on avoiding collateral damage.¹¹⁴

Besides the targeting process, management of the joint air tasking cycle was another item in OEF air campaign planning that was retained at the highest possible level. CENTCOM decided, contrary to common procedure in joint air doctrine, to keep most of the planning phases in the joint air tasking cycle at CENTCOM. Joint doctrine recommends delegation of the joint air tasking cycle to the joint force air component commander (JFACC), who is responsible for planning, coordinating, allocating and tasking joint air missions in accordance with JFC guidance.¹¹⁵ However, because of the major difference in time zones, CENTCOM never delegated this process.¹¹⁶ Consequently, the geographic location of headquarters drove operational procedures and not mission characteristics.

On the operational level, the CAOC at Prince Sultan Air Base was ready for operations, as opposed to the CAOC in Vicenza at the beginning of OAF.¹¹⁷ The CAOC was the most modern and sophisticated CAOC ever constructed, and even though the Saudis put a cap on US pres-

ence in the CAOC, its staff vastly outnumbered the CAOC in Vicenza during OAF. Finally, there were no examples of service rivalry in the CAOC, but only reports of all services working together as a coherent and cooperative group.¹¹⁸

Conclusion Operation Enduring Freedom

OEF is an ongoing operation, but March 2002 saw the end of the air campaign aimed at destroying Al Qaeda activities in and out of Afghanistan. OEF toppled the Taliban regime and denied refuge to Al Qaeda in Afghanistan, thus meeting most of the objectives as stated by President Bush and Secretary Rumsfeld. Air power proved an effective military IOP at the operational level, but it took a ground force (SOF/local Afghans) to ensure proper utilization.

ANALYSIS

The belief in the possibility of a short decisive war appears to be one of the most ancient and dangerous of human illusions.

— Robert Lynd

This chapter will analyze the OAF and OEF case studies by using the analytical tools of thought, technology, and organization to highlight positive aspects and shortcomings in relation to the successful conduct of EBO.

Thought

Both case studies involved an initial conflict between air power advocates wanting to pursue a pure effects-based approach and traditionalists insisting on a more attrition-based approach. However, in OAF, even though Gen Wesley Clark personally wanted to target the FRY forces directly, he also recognized that political restraints denied the use of air power in an effects-based approach aimed at Serbian leadership.¹¹⁹ In both cases, the person highest in the command structure prevailed, and the air campaigns then centered on a more attrition-based approach. The attrition-based approach employed in OAF and OEF bears the closest resemblance to Pape's denial theory. However, some differences exist, as Pape's denial theory is more than just attrition, it holds elements of EBO as well.

In OAF, the aim was to thwart Serbia's military strategy by destroying its military forces. Contrary to Pape's denial theory, air power worked alone and not in support of a credible ground force. This caused FRY military forces to scatter and greatly reduced the effectiveness of air power. Additionally, insufficient IPB made it even harder to locate targets and worsened the situation for air power.

In OEF, air power worked in support of a credible ground force—in the form of SOF and local Afghans like the Northern Alliance. The purpose of denial is, according to Pape, to deny the enemy achievement of his military strategy. In OEF, targets were selected whether or not they supported this objective. It was a purely attrition-based approach, with the sole aim of reducing the numbers of Taliban and Al Qaeda military assets. The focus on physical targets, as opposed to objectives, resulted in a waste of time and resources.¹²⁰ This was especially true in the latter part of the campaign, where the US had suppressed most of the enemy's military capability in Afghanistan, but kept on destroying targets. This illustrates the need for BDA to consider effects and not only physical damage.

If the JFC and the national command authorities had allowed a decapitation-based approach during OEF, like that described by Warden and Deptula, there would have been no guaranty of a successful air campaign. On the contrary, a decapitation-based approach is highly dependent on sufficient intelligence support for assessing effects, before and after attacks.¹²¹ Neither of the operations had that scale of intelligence support available. Additionally, BDA is still only focusing on assessing physical damage and not effects; the discussion of that has only just begun.¹²²

Technology

Both case studies saw a general use of technology much more sophisticated than experienced earlier—a true RMA. Stealth made bombing possible in spite of a dense IADS. JDAM made all-weather precision bombing possible, and ISR platforms and networking technology reduced the sensor to shooter loop and enabled further decentralization. However, with advances in technology came advances in expectations.

OAF and OEF witnessed severe restraints in targeting due to a strong emphasis on reducing collateral damage. Network technology also made centralized control and execution possible and tempting.¹²³ Instead of using technology to further enable decentralized execution, many cases saw centralized execution with high-level commanders tied up in tactical details.¹²⁴ In general, RMA removed the technological constraint (for now) and highlighted the need for innovation in other areas in order to conduct EBO successfully.

Technology has enabled air power to strike over vast distances under all conditions. This reveals the importance of intelligence and assessment to locate and assess the right targets to reach the right effects.¹²⁵ To fully utilize the true potential of RMA requires a far greater intelligence capability than OAF and OEF displayed.¹²⁶ Technology has made it possible to strike targets that are only available for a short period—called time sensitive targeting (TST). Experiences from OEF clearly demonstrate that the decision making cycle now is the major constraint. Without purposely established ROEs and a tight decision-making process, TST will remain nothing but a concept that is technologically feasible but impossible in practice.

Even though the previous paragraph claims that the technological constraints have been removed, there is room for improvement. Today's PGMs are WWII technology with improved guidance units. Thinking EBO, future weapons development might be oriented towards effects instead of blast radius, fragmentation, and precision. The use of CBU-94 (munition with carbon-graphite threads) is a great example of this, as well as the ongoing development of non-kinetic weapons.¹²⁷ However, presently other areas like intelligence, assessment, and command and control structures and procedures lag far behind technology, thus making more technological innovation the least important aspect in conducting EBO successfully.

Organization

On the organizational side, OAF and OEF reflect a trend toward centralized execution made possible by technology, as described above.¹²⁸ Strategic commanders and the political leadership were heavily engaged in targeteering, which is usually a CAOC task. In OAF, targets had to be approved by all 19 NATO member states. In OEF, the political leadership put severe restrictions on targeting, which occurred at CENTCOM HQ in Florida instead of the CAOC in Saudi Arabia as joint doctrine prescribes. The target selection and approval process is now so complicated because of political and legal considerations that it results in loss of military effectiveness.¹²⁹

JPUB 3-30 provides the doctrinal basis for command and control in joint air operations by describing the JFACC's authority, command relationship and responsibilities. One focal point is the decentralized joint air tasking cycle, which gives the JFACC the possibility to utilize the joint air assets most effectively to support the JFC's objectives. However, the tendency to centralize execution of joint air operations does not meet the thought behind JPUB 3-30.

Moreover, Air Force counterland doctrine (AFDD 2-1.3) does not reflect the unique characteristics of direct attack as a separate mission.¹³⁰ AFDD 2-1.3 divides counterland into the two categories of Air Interdiction (AI) and CAS, which both are missions in support of one's own ground forces. The most common strike mission in OAF and OEF did not relate directly to the progress of one's own ground forces, but was a direct attack on enemy forces. In OAF, there was no NATO ground force to support, and in OEF, many missions were independent of friendly ground operations, although air power often relied on intelligence from ground forces.¹³¹

However, US Air Force has tried to patch up AFDD 2-1.3 (p. 23) and expanded the scope of AI to include direct attack by adding the phrase "...or otherwise achieve its objectives." to the

end of the definition of AI. Doctrine forms the basis for manning, training, and equipping units to meet their combat ready requirements. Until Air Force doctrine recognizes direct attack as a separate counterland mission, the USAF will not man, train, and equip itself to conduct this aspect of counterland operations successfully.

CONCLUSION

Military men are dumb, stupid animals to be used as pawns for foreign policy.

— Henry Kissinger

The case studies reaffirms what Carl von Clausewitz wrote almost 200 years ago in his classic *On War*, “War is merely the continuation of policy by other means.”¹³² In OAF, air power was just one tool used in coercive diplomacy. Likewise, during OEF, air power was a part of the military IOP utilized in the global war on terror, which incorporates every IOP. Consequently, it is reasonable to examine air power as the military IOP in a multifaceted approach. This paper has examined the application of air power in EBO through case studies of OAF and OEF, and uncovered distinctive relations between thought, technology, and organization. The paper covered each area separately, but the conclusion will show how thought, technology, and organization, in relation to the successful application of air power in EBO, are interdependent.

Thought

Air power needs at least one of two things; either a credible ground force to mass targets in order for air power to target and destroy them following a denial type approach like the one seen in OAF and OEF. Alternatively, pursue a decapitation-based approach; air power needs intelligence support in the form of IPB and BDA with an effects-based mindset.¹³³ Ideally, both solid intelligence and a credible ground force will be available.

Technology

The present level of technology permits a precise application of air power any time and under any conditions—the technological restraint has been removed for the time being. But, to achieve the desired effect of a precise application of air power, it requires a sufficient capability of intelligence and assessment. IPB is crucial to build the right target list in order to achieve the desired effect, and BDA is a requirement to assess the effect of applied air power to effectively plan future operations. Moreover, a timely decision-making process must be in place to ensure efficient targeting procedures that permits TST. Legal and political restraints threaten to make the achievements in technology irrelevant because of the time presently needed to get approval to strike a target.

Further technological developments are not as important as resolving the previous mentioned issues. However, one might consider pursuing technologies, like non-kinetic weapons, that seek effects directly instead of using destruction to induce second-order effects. This could counter political restraints and indirectly aid in improving the decision-making process, although it might raise the expectation of technology even further, as seen with the introduction of PGMs.

Organization

Application of air power since 1999 has witnessed a tendency towards centralized planning down to the tactical level, as well as centralized execution. A time-consuming decision-making process in target approval and allocation has now become the major restraint in the kill chain. Because of the time needed for strategic level commanders and politicians to reach a decision on tactical matters, performance has suffered in large scale and/or time critical scenarios.

Nevertheless, centralized execution could be the only way to apply air power successfully in EBO in an environment with political restraints as witnessed in OAF and OEF. One must not

be too blind to see, that technology enables centralized execution of EBO on a limited scale, even though this hardly was the idealistic intention. Technology still supports EBO on a larger scale, but this requires decentralized execution of air power as presently depicted in JPUB 3-30.

Additionally, the case studies show that the counterland mission of direct attack is not included in Air Force doctrine. Doctrine must include new types of missions allowed by technology and inspired by thought to ensure the manning, training, and equipment necessary to be successful in future operations like OAF and OEF.

FINAL THOUGHTS AND CONCLUSION

The following chart illustrates the interdependence of thought, technology, and organization to employ air power in EBO successfully.

To From	Thought	Technology	Organization
Thought		Improvements in effects-based IPB & BDA are prerequisites for utilizing technology successfully in EBO.	Improved IPB & BDA improves the decision-making process as the basis for decision-making improves.
Technology	Present level of technology enables the practice of EBO as thought prescribes – the technological constraint removed (for now).		<ul style="list-style-type: none"> Improved technology towards effects-based non-kinetic weapons can make use more politically acceptable and thus remove some restraints in usage. Improved technology raises expectations for performance, hence creating implicit restraints.
Organization	A streamlined decision-making process and less political restraints will enable the use of air power thought as intended.	A streamlined decision-making process and less political restraints will improve the timely employment of weapons.	

In conclusion, the case studies of OAF and OEF indicate that air power is not mature enough to be the sole military IOP in EBO. Furthermore, air power is presently not capable of achieving second order effects at the strategic level on its own but only in conjunction with other IOPs, like diplomacy. As Pape wrote:

The leading advocates of the precision revolution have it exactly backwards. Precision weaponry has done little to enhance the coercive strength of enemy decapitation or other new strategies, which often fail because of inadequate intelligence. After a decade and a half trying—and failing—to solve this intelligence problem, it may be time to recognize that it will not be overcome any time soon. Until it is, the combined use of air power and ground forces—whose potency has been multiplied by precision weapons—remains the most effective way for the United States to win major wars.¹³⁴

Presently, air power is much more effective at achieving second order effects in conjunction with land forces at the operational level.

END NOTES

¹ Steven C. Carey and Robyn S. Read, "Five Propositions Regarding Effects-Based Operations," *Air & Space Power Journal*, Spring 2006, 65.

² Haywood S. Hansell, Jr., *The Air Plan That Defeated Hitler*, (Atlanta, GA: Higgins-McArthur/Longino & Porter, 1972), pp. 67-70 & 100-102.

³ David A. Deptula, "Effects-Based Operations," *Air & Space Power Space Journal*, Spring 2006, 4.

⁴ Using OAF as proof, Keegan claims, that air power can win a war alone. John Keegan, "Please, Mr. Blair, never take such a risk again," *London Daily Telegraph*, Issue 1472, 6 June 1999. Available at: <http://www.telegraph.co.uk/htmlContent.jhtml?html=/archive/1999/06/06/wkee06.html>. Furthermore, Grant emphasizes the role of air power in OEF in her article "An Air War Like No Other", where she advocates how joint air power can achieve a combatant commander's objectives with little support from other services. Rebecca Grant, "An Air War Like No Other," *Air Force Magazine*, November 2002, 37.

⁵ JFCOM defines EBO as "Operations that are planned, executed, assessed, and adapted based on a holistic understanding of the operational environment in order to influence or change system behavior or capabilities using the integrated application of selected instruments of power to achieve directed policy aims." Joint Forces Command, "Operational Implications of Effects-Based Operations (EBO)," Joint Doctrine Series, Pamphlet 7, 17 November 2004, 32.

⁶ T.W. Beagle Jr., "Effects-Based Targeting: Another Empty Promise?," in *Strategy and War Academic Year 2006 Coursebook*, ed. Sharon McBride et al. (Maxwell AFB, AL: Air Command and Staff College, September 2005), 344.

⁷ Air Force Doctrine Document 2, "Organization and Employment of Aerospace Power," 17 February 2000, pp. 2-3.

⁸ Bert Frandsen, "The Operational Art from the Airman's Perspective," in *The Academic Year 2006 Expeditionary Air and Space Power Coursebook*, ed. Sharon McBride et al. (Maxwell AFB, AL: Air Command and Staff College, November 2005), 6.

⁹ John Shy, "Jomini," in *Makers of Modern Strategy: From Machiavelli to the Nuclear Age*, ed. Peter Paret et al. (Princeton, NJ: Princeton University Press, 1986), p. 146.

¹⁰ Ibid., p. 154.

¹¹ Henri de Jomini, "The Art of War" in *From Antiquity to the Nuclear Age: The Art of War in World History*, ed. Gérard Chaliand (Los Angeles, CA: University of California Press, 1994), p. 739.

¹² Shy, p. 154.

¹³ Carl von Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton, NJ: Princeton University Press, 1976), p. 596.

¹⁴ Ibid., pp. 595-597.

¹⁵ Ibid., p. 596.

¹⁶ Giulio Douhet, *The Command of the Air*, trans. Dino Ferrari (Washington, D.C.: Office of Air Force History, 1983), pp. 19-23.

¹⁷ William Mitchell, *Winged Defense: The Development and Possibilities of Modern Air Power—Economic and Military*, (Toronto: General Publishing Company, 1988), pp. 126-127.

¹⁸ Haywood S. Hansell Jr., “The Development of the United States Concept of Bombardment Operations,” in *The Academic Year 2006 Expeditionary Air and Space Power Coursebook*, ed. Sharon McBride et al. (Maxwell AFB, AL: Air Command and Staff College, November 2005), 10.

¹⁹ Christopher Bence, “Warden Vs Pape,” *Air & Space Power Chronicles – Chronicles Online Journal*, document created on 28 February 2000, np. Available at: <http://www.airpower.maxwell.af.mil/airchronicles/cc/bence.html>

²⁰ John A. Warden, “The Enemy as a System,” *Airpower Journal*, Spring 1995, np. Available at: <http://www.airpower.maxwell.af.mil/airchronicles/apj/warden.html>

²¹ Ibid.

²² Ibid.

²³ Robert A. Pape’s book *Bombing to Win* (1996) has a fourth category of coercive air power named risk. This is basically a form of gradual punishment with operational pauses for diplomatic efforts. However, in his later work, *The Limits of Precision Guided Air Power* (1998), risk is no longer an independent category but presumed integrated into punishment.

²⁴ Robert A. Pape, “The Limits of Precision-Guided Air Power,” *Security Studies* 7, no. 2 (Winter 1997/1998), 97.

²⁵ Robert A. Pape, *Bombing to Win: Air Power and Coercion in War*, (Ithaca, NY: Cornell University Press, 1996), p. 10.

²⁶ Ibid.

²⁷ David A. Deptula, *Effects-Based Operations: Change in the Nature of Warfare*, (Arlington, VA: Aerospace Education Foundation, 2001), p. 25.

²⁸ Ibid., pp. 19-20.

²⁹ FRY forces includes all forces from the Federal Republic of Yugoslavia and Republic of Serbia personnel and organizations with a military capability. North Atlantic Treaty Organisation, (Military Technical Agreement: Between the International Security Force (“KFOR”) and the Governments of the Federal Republic of Yugoslavia and the Republic of Serbia, 9 June 1999), para 3c. Available online: <http://www.nato.int/kosovo/docu/a990609a.htm>

³⁰ Benjamin S. Lambeth, *NATO’s Air War for Kosovo: A Strategic and Operational Assessment*, (Arlington, VA: RAND, 2001), p. 219.

³¹ Department of Defense, *Report to Congress: Kosovo/Operation Allied Force After-Action Report*, (Department of Defense, 2002), pp. 3-4. Available at <http://www.globalsecurity.org/military/library/report/2000/kaar02072000.pdf>

³² Lambeth, *NATO’s Air War*, pp. 7-9.

³³ William J. Clinton (televised national address, Washington, DC, 24 March 1999), np.. Transcript available online: <http://www.cnn.com/ALLPOLITICS/stories/1999/03/25/clinton.transcript/>

³⁴ President Clinton believed that US soldiers should participate in a peacekeeping force, if Milosevic decided to accept the peace agreement. However, President Clinton followed that remark by “...but I do not intend to put our troops in Kosovo to fight a war.” and thereby ruled out the possibility of a credible ground campaign. Clinton, np.

³⁵ North Atlantic Treaty Organisation (NATO) (Statement issued at extraordinary ministerial meeting of the North Atlantic Council, Brussels, Belgium, 12 April 1999). Available at <http://www.nato.int/docu/pr/1999/p99-051e.htm>.

³⁶ Benjamin S. Lambeth, *The Transformation of American Air Power*, (Ithaca, NY: Cornell University Press, 2000), p. 181.

³⁷ Lambeth, *NATO’s Air War*, pp. 13-14.

³⁸ Thomas C. Hone, “Strategic Bombardment Constrained: Korea and Vietnam,” in *Case Studies in Strategic Bombardment*, ed. R. Cargill Hall (Washington, DC: Air Force History and Museums Program, 1998), p. 495.

³⁹ Rebecca Grant, *The Kosovo Campaign: Aerospace Power Made It Work*, (Arlington, VA: The Air Force Association, 1999), p. 8; Lambeth, *NATO’s Air War*, p. 199.

⁴⁰ Scott A. Cooper, “Air Power and the Coercive Use of Force,” in *Immaculate Warfare: Participants Reflect on the Air Campaign over Kosovo and Afghanistan*, ed. Stephen D. Wrage (Westport, CT: Praeger Publishers, 2003), p. 12.

⁴¹ Pape, “The Limits of Precision-Guided Air Power,” 101.

⁴² Cooper, pp.12-13.

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- ⁴³ Lambeth, *NATO's Air War*, p. 201.
- ⁴⁴ Ibid., pp. 212 & 231.
- ⁴⁵ Ibid., pp. 89-90.
- ⁴⁶ Anthony H. Cordesman, *The Lessons and Non-Lessons of the Air and Missile Campaign in Kosovo*, (Westport, CT: Praeger Publishers, 2001), p. 49.
- ⁴⁷ Department of Defense, *Report to Congress*, p. 91.
- ⁴⁸ Other types of UAVs were the RQ-5 Hunter from the US Army, the RQ-2 Pioneer from the US Navy, the British Phoenix, and the German and French CL-289. Cordesman, *The Lessons and Non-Lessons*, pp. 352-355.
- ⁴⁹ Department of Defense, *Report to Congress*, pp. 56-57.
- ⁵⁰ Ibid., p. 57.
- ⁵¹ Cordesman, *The Lessons and Non-Lessons*, p. 353.
- ⁵² Stephen D. Wrage, "The Ethics of Precision Air Power," in *Immaculate Warfare: Participants Reflect on the Air Campaign over Kosovo and Afghanistan*, ed. Stephen D. Wrage (Westport, CT: Praeger Publishers, 2003), p. 93.
- ⁵³ Ibid., p. 91.
- ⁵⁴ On April 12, 1999, a rail bridge over the river Jusna Morava was struck just as a passenger train crossed. On April 14, 1999, allied pilots mistook civilian vehicles for a military convoy in Kosovo near the town of Djakovica. On May 7, 1999, a B-2 bomber struck the Chinese Embassy in Belgrade believing that the building housed the headquarters of a Yugoslav arms agency. Benjamin S. Lambeth, *NATO's Air War for Kosovo*, pp. 136-144.
- ⁵⁵ Wrage, p. 92.
- ⁵⁶ Lambeth, *NATO's Air War*, p. 40.
- ⁵⁷ Cordesman, *The Lessons and Non-Lessons*, pp. 68-69.
- ⁵⁸ Lambeth, *NATO's Air War*, p. 210.
- ⁵⁹ Ibid., pp. 210-211.
- ⁶⁰ Ibid., pp. 209-210.
- ⁶¹ Department of Defense, *Report to Congress*, p. 20.
- ⁶² Cordesman, *The Lessons and Non-Lessons*, pp. 66-70.

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- ⁶³ Department of Defense, *Report to Congress*, p. 24.
- ⁶⁴ Lambeth, *NATO's Air War*, p. 205.
- ⁶⁵ Cordesman, *The Lessons and Non-Lessons*, p. 283.
- ⁶⁶ Lambeth, *NATO's Air War*, p. 212.
- ⁶⁷ Department of Defense, *Report to Congress*, pp. 28-29.
- ⁶⁸ Ibid.
- ⁶⁹ Ibid., p. 117.
- ⁷⁰ North Atlantic Treaty Organisation, (Military Technical Agreement, np.
- ⁷¹ Lambeth, *The Transformation*, p. 188.
- ⁷² Daniel L. Byman and Matthew C. Waxman, "Kosovo and the Great Air War Debate," in *The Academic Year 2006 Expeditionary Air and Space Power Coursebook*, ed. Sharon McBride et al. (Maxwell AFB, AL: Air Command and Staff College, November 2005), 156.
- ⁷³ Cordesman, *The Lessons and Non-Lessons*, p. 84.
- ⁷⁴ Lambeth, *NATO's Air War*, p. 24.
- ⁷⁵ Cordesman, *The Lessons and Non-Lessons*, pp. 193-196 (aircraft), pp. 197-205 (IADS), pp. 208-223 (army units).
- ⁷⁶ Benjamin S. Lambeth, *Air Power Against Terror: America's Conduct of Operation Enduring Freedom*, (Arlington, VA: RAND, 2005), pp. 49-50.
- ⁷⁷ Ibid., p. 51.
- ⁷⁸ George W. Bush (address to Congress, Washington, DC, 20 September 2001). Available at: <http://www.whitehouse.gov/news/releases/2001/09/20010920-8.html>
- ⁷⁹ Donald H. Rumsfeld, *Annual Report to the President and the Congress* (2002), p. 28.
- ⁸⁰ Lambeth, *Air Power Against Terror*, p. 59.
- ⁸¹ Ibid., p. 301.
- ⁸² Ibid.
- ⁸³ Ibid., pp. 301-302.

⁸⁴ A good example of this is the definition of air superiority in the area of responsibility of OEF. The massive presence of allied air power caused inherent air superiority, because it served as a deterrent for the Taliban to launch aircraft or activate air defenses even if such were available. CENTCOM would not agree that the coalition had established air superiority until all enemy assets that could dispute this were destroyed. Lambeth, *Air Power Against Terror*, pp. 301-302.

⁸⁵ Milan Vego, "What Can We Learn from Enduring Freedom?" *Naval Institute Proceedings Magazine*, July 2002, np. Available at: <http://www.usni.org/Proceedings/Articles02/PROvego07.htm>

⁸⁶ Ibid.

⁸⁷ John G. Roos, "Turning Up The Heat: Taliban Became Firm Believers In Effects-Based Operations," *Armed Forces Journal International*, February 2002, 36.

⁸⁸ Robert A. Pape, "The True Worth of Air Power," *Foreign Affairs* 83, no. 2 (March/April 2004), 126-127.

⁸⁹ Two such examples are the AGM-86D (air-launched cruise missile with a conventional heavy warhead) and the GBU-24 (laser-guided bomb with a core made of heavy alloys). Lambeth, *Air Power Against Terror*, pp. 288-289.

⁹⁰ This weapon consists of a BLU-118B with a thermobaric explosive warhead in penetrator shell (standard BLU-109 penetrator body). The weapon can be employed by a GBU-15 (TV/IR guided bomb), GBU-24 (laser-guided bomb), or AGM-130 (TV/IR guided air-to-ground missile). Anthony H. Cordesman, *The Lessons of Afghanistan: War Fighting, Intelligence, and Force Transformation*, (Washington, DC: The CSIS Press, 2002), p. 48.

⁹¹ Lambeth, *Air Power Against Terror*, p. 251.

⁹² Ibid., p. 252.

⁹³ Cordesman, *The Lessons of Afghanistan*, pp. 103-105.

⁹⁴ The Global Hawk deployed to OEF was the Advanced Concept Technology Demonstrator (ACTD). More than two thirds of its flight hours have been accumulated on combat missions. Defense Update, "International Online Defense Magazine," <http://www.defense-update.com/products/g/globalhawk.htm#sigint>

⁹⁵ The MQ-1 Predator (M for multi-role) is a further development of the RQ-1 Predator. The most advanced versions employed in OEF now incorporated the possibility of armament (two AGM-114 Hellfire missiles), radios, IFF/SIF including Mode 4, and laser designators or a variation of these. The MQ-1 Predator was the first US unmanned combat air vehicle (UCAV). Lambeth, *Air Power Against Terror*, p. 251.

⁹⁶ Ibid., pp. 253-254.

⁹⁷ David A. Fulghum, "Intel Emerging as Key Weapon in Afghanistan," *Aviation Week & Space Technology*, 11 March 2002, 24.

⁹⁸ Lambeth, *Air Power Against Terror*, pp. 253-254.

⁹⁹ Ibid., pp. 263-265.

¹⁰⁰ Phil M. Haun, "Direct Attack – A Counterland Mission," *Air and Space Power Journal*, Summer 2003, 9.

¹⁰¹ Cordesman, *The Lessons of Afghanistan*, p. 79.

¹⁰² Ibid., p. 80.

¹⁰³ Ibid., p. 78; Vego, np.

¹⁰⁴ John B. Nathman, "We Were Great: Navy Air in Afghanistan," *Naval Institute Proceedings Magazine*, March 2002, np. Available at: <http://www.usni.org/proceedings/Articles02/PROnathman03.htm>

¹⁰⁵ One example of the reduced kill chain involves a FAC on a SOF team embedded with troops from the Northern Alliance. He calls in a target via satellite link and the CAOC redirects the coordinates to a nearby orbiting B-52. The target, a Taliban tank and troop formation, was destroyed 19 minutes later. Lambeth, *Air Power Against Terror*, pp. 260-261; Cordesman, *The Lessons of Afghanistan*, pp. 101-102&110.

¹⁰⁶ Pape, "The True Worth of Air Power," 117; Roos, 38.

¹⁰⁷ On October 7, 2001, a MQ-1 Predator observed a Taliban column of vehicles that intelligence experts assessed to include top members of the Taliban. The CAOC sent a request for attack on the column to CENTCOM. Because of the chance of collateral damage, standard CENTCOM procedures called for approval to be obtained from the CENTCOM commander as well as from Washington. The time needed for this procedure caused the Taliban top leadership to escape from the scene unharmed. Benjamin S. Lambeth, *Air Power Against Terror*, pp. 313-314; Cordesman, *The Lessons of Afghanistan*, p. 110.

¹⁰⁸ Lambeth, *Air Power Against Terror*, pp. 304-306.

¹⁰⁹ Ibid., pp. 295-299.

¹¹⁰ Proper liaison between the joint forces air component commander (JFACC) and the JFC is emphasized in AFDD 2 to ensure cross-flow of information. Air Force Doctrine Document 2, "Organization and Employment of Aerospace Power," 17 February 2000, p. 49.

¹¹¹ Vego, np.

¹¹² Ibid.

¹¹³ Ibid.

¹¹⁴ Ibid.

¹¹⁵ According to JPUB 3-30, III-20 – III-24, the air component will develop targets (phase 2), conduct weaponeering and allocation (phase 3), and produce an air tasking order (ATO) (phase 4) based upon the guidance and objectives of the JFC.

¹¹⁶ Lambeth, *Air Power Against Terror*, pp. 308-312.

¹¹⁷ Ibid., pp. 280-281.

¹¹⁸ Ibid., p. 281.

¹¹⁹ Cooper, p. 13.

¹²⁰ Vego, np.

¹²¹ Carey and Read, 70.

¹²² Douglas E. Lee and Timothy Albrecht, “Transforming Battle Damage Assessment into Effects-Based Assessment,” *Air & Space Power Journal*, Spring 2006, 51.

¹²³ Lambeth, *Air Power Against Terror*, p. 324.

¹²⁴ Vego, np.

¹²⁵ Pape, “The True Worth of Air Power,” 118.

¹²⁶ Cordesman, *The Lessons of Afghanistan*, pp. 113-115.

¹²⁷ Jack Sine, “Defining the “Precise Weapon” in Effects-Based Terms,” *Air & Space Power Journal*, Spring 2006, 84.

¹²⁸ Lambeth, *Air Power Against Terror*, p. 324.

¹²⁹ Vego, np.

¹³⁰ Haun, 14-16.

¹³¹ Haun, 10.

¹³² Clausewitz, p. 87.

¹³³ Pape, “The True Worth of Air Power,” 118.

¹³⁴ Ibid., 130.

BIBLIOGRAPHY

- Air Force Doctrine Document (AFDD) 1. Air Force Basic Doctrine, 17 November 2003.
- Air Force Doctrine Document (AFDD) 2. Organization and Employment of Aerospace Power, 17 February 2000.
- Air Force Doctrine Document (AFDD) 2-1.3. Counterland, 27 August 1999.
- Bacevich, Andrew J., and Eliot A. Cohen. *War over Kosovo: Politics and Strategy in a Global Age*. Edited by Andrew J. Bacevich and Eliot A. Cohen. New York, N.Y.: Columbia University Press, 2001.
- Beagle, T.W. Jr. "Effects-Based Targeting: Another Empty Promise?" In *Strategy and War Academic Year 2006 Coursebook*. Edited by Sharon McBride et al., Maxwell AFB, AL: Air Command and Staff College, September 2005: 344-364.
- Beagle, T.W. Jr. "Effects-Based Targeting: Another Empty Promise?" Maxwell AFB, AL: School of Advanced Air Power and Space Studies, June 2000.
- Bence, Christopher. "Warden Vs Pape." *Air & Space Power Chronicles – Chronicles Online Journal*, document created on 28 February 2000. Available at: <http://www.airpower.maxwell.af.mil/airchronicles/cc/bence.html> (accessed 31 MAR 2006).
- Berg, Paul D. "Effects-Based Airpower and Space Power." *Air and Space Power Journal*, Spring 2006: 17.
- Bush, George W. Address. Congress, Washington, D.C., 20 September 2001. Available at: <http://www.whitehouse.gov/news/releases/2001/09/20010920-8.html> (accessed 1 March 2006).
- Byman, Daniel L. and Matthew C. Waxman. "Kosovo and the Great Air Power Debate." In *Expeditionary Air and Space Power Academic Year 2006 Coursebook*. Edited by Sharon McBride et al., Maxwell AFB, AL: Air Command and Staff College, November 2005: 156-177.
- Byman, Daniel L., Matthew C. Waxman, and Eric V. Larson. *Air Power as a Coercive Instrument*. Arlington, VA: RAND, 1999.
- Carey, Steven C., and Robyn S. Read. "Five Propositions Regarding Effects-Based Operations." *Air and Space Power Journal*, Spring 2006: 63-74.
- Clausewitz, Carl von. *On War*. Edited and translated by Michael Howard and Peter Paret. Princeton, NJ: Princeton University Press, 1976.

- Clinton, William J. Televised national address, 24 March 1999. Transcript available online: <http://www.cnn.com/ALLPOLITICS/stories/1999/03/25/clinton.transcript/> (accessed 19 FEB 2006).
- Cordesman, Anthony H. *The Lessons and Non-Lessons of the Air and Missile Campaign in Kosovo*. Westport, CT: Praeger Publishers, 2001.
- Cordesman, Anthony H. *The Lessons of Afghanistan: War Fighting, Intelligence, and Force Transformation*. Washington, D.C.: The CSIS Press, 2002.
- Crowder, Gary L. "Effects-Based Operations: The Impact of Precision Strike Weapons on Air Warfare Doctrines." *Military Technology*, June 2003: 16-25.
- Defense Update. "International Online Defense Magazine." <http://www.defense-update.com/products/g/globalhawk.htm#sigint> (accessed 25 February 2006).
- Department of Defense. *Report to Congress: Kosovo/Operation Allied Force After-Action Report*. Department of Defense, 2000. Available at <http://www.globalsecurity.org/military/library/report/2000/kaar02072000.pdf> (accessed 16 FEB 2006).
- Deptula, David A. "Effects-Based Operations." *Air and Space Power Journal*, Spring 2006: 4-5.
- Deptula, David A. *Effects-Based Operations: Change in the Nature of Warfare*. Arlington, VA: Aerospace Education Foundation, 2001.
- Deptula, David A., Col Gar L. Crowder, and Maj Georle L. Stamper Jr. "Direct Attack: Enhancing Counterland Doctrine and Joint Air-Ground Operations." *Air and Space Power Journal*, Winter 2003: 5-12.
- Douhet, Giulio. *The Command of the Air*. Translated by Dino Ferrari. Washington, D.C.: Office of Air Force History, 1983.
- Finn, Chris. "The Employment of Air Power in Afghanistan and Beyond." *The Royal Air Force Air Power Review*, Winter 2002: 1-13.
- Frandsen, Bert. "The Operational Art from the Airman's Perspective" in *The Academic Year 2006 Expeditionary Air and Space Power Course*. Edited by Sharon McBride et al., Maxwell AFB, AL: Air Command and Staff College, November 2005: 1-6.
- Fulghum, David A. "Intel Emerging as Key Weapon in Afghanistan." *Aviation Week & Space Technology*, 11 March 2002: 24-25.
- Grange, David L., Walter Bjerneby, Kelly Sullivan, Mike Sparks, and Chuck Myers. "The close-air-support imperative: Failings in Afghanistan highlights deficiencies in U.S. Air Force doctrine and equipment." *Armed Forces Journal*, December 2002: 14-15.

- Grant, Rebecca. "An Air War Like No Other." *Air Force Magazine*, November 2002: 30-37.
- Grant, Rebecca. "The War Nobody Expected." *Air Force Magazine*, April 2002: 34-40.
- Grant, Rebecca. *The Kosovo Campaign: Aerospace Power Made It Work*. Arlington, VA: The Air Force Association, 1999.
- Grant, Rebecca. *The Mission: Waging War and Keeping Peace With America's Military*. New York, NY: W.W. Norton & Company Inc., 2003.
- Grier, Peter. "The Combination That Worked." *Air Force Magazine*, April 2002: 30-32.
- Hansell, Haywood S., Jr. "The Development of the United States Concept of Bombardment Operations." In *Expeditionary Air and Space Power Academic Year 2006 Coursebook*. Edited by Sharon McBride et al., Maxwell AFB, AL: Air Command and Staff College, November 2005: 8-15.
- Hansell, Haywood S., Jr. *The Air Plan That Defeated Hitler*. Atlanta, GA: Higgins-McArthur/Longino & Porter, 1972.
- Haun, Phil M.. "Direct Attack – A Counterland Mission." *Air and Space Power Journal*, Summer 2003: 9-16.
- Headquarters United States Air Force. Initial Report The Air War over Serbia: Aerospace Power in Operation Allied Force, April 2000.
- Hone, Thomas C. "Strategic Bombardment Constrained: Korea and Vietnam." In *Case Studies in Strategic Bombardment*. Edited by R. Cargill Hall, Washington, DC: Air Force History and Museums Program, 1998: 469-526.
- Hunerwadel, J. P. "Overpromising and Underestimating: A Response to "Five Propositions Regarding Effects-Based Operations"." *Air and Space Power Journal*, Spring 2006: 75-80.
- Hunerwadel, J. P. "The Effects-Based Approach to Operations: Questions and Answers." *Air and Space Power Journal*, Spring 2006: 53-62.
- Jogerst, John. "What's So Special about Special Operations? Lessons from the War in Afghanistan." *Aerospace Power Journal*, Summer 2002: 98-102.
- Joint Forces Command. Operational Implications of Effects-Based Operations (EBO), Joint Doctrine Series, Pamphlet 7, 17 November 2004.
- Joint Publication (JPUB) 3-30. Command and Control for Joint Air Operations, 5 June 2003.
- Jomini, Henri de. "The Art of War." in *From Antiquity to the Nuclear Age: The Art of War in World History*. Edited by Gérard Chaliand. Los Angeles, CA: University of California Press, 1994: 724-743.

- Kauchak, Marty. "Focus on OEF's Air Campaign: Funding, New Doctrine Needed To Continue Air Campaign's Legacy." *Armed Forces Journal International*, March 2002: 20-22.
- Keegan, John. "Please, Mr. Blair, never take such a risk again." *London Daily Telegraph*, Issue 1472, 6 June 1999, np. Available at: <http://www.telegraph.co.uk/htmlContent.jhtml?html=/archive/1999/06/06/wkee06.html> (accessed 2 April 2006).
- Lambeth, Benjamin S. *Air Power Against Terror: America's Conduct of Operation Enduring Freedom*. Arlington, VA: RAND, 2005.
- Lambeth, Benjamin S. *NATO's Air War for Kosovo: A Strategic and Operational Assessment*. Arlington, VA: RAND, 2001.
- Lambeth, Benjamin S. *The Transformation of American Air Power*. Ithaca, NY: Cornell University Press, 2000.
- Lee, Douglas E., and Timothy Albrecht. "Transforming Battle Damage Assessment into Effects-Based Assessment." *Air and Space Power Journal*, Spring 2006: 51-52.
- Meilinger, Philip S. *Airwar: Theory and Practice*. Portland, OR: Frank Cass Publishers, 2003.
- Meilinger, Phillip S. *The Paths of Heaven: The Evolution of Airpower Theory*. Edited by Philip S. Meilinger, Maxwell AFB, AL: Air University Press, 1997.
- Mitchell, William. *Winged Defense: The Development and Possibilities of Modern Air Power—Economic and Military*. Toronto: General Publishing Company, 1988.
- Nathman, John B. "We Were Great: Navy Air in Afghanistan". *Naval Institute Proceedings Magazine*, March 2002: 94-96. Accessed through the EBSCOhost database, also available at: <http://www.usni.org/proceedings/Articles02/PRONathman03.htm>
- North Atlantic Treaty Organisation (NATO). Military Technical Agreement: Between the International Security Force ("KFOR") and the Governments of the Federal Republic of Yugoslavia and the Republic of Serbia. 9 June 1999. Available online: <http://www.nato.int/kosovo/docu/a990609a.htm> (accessed 19 FEB 2006).
- North Atlantic Treaty Organisation (NATO). Statement Issued at the extraordinary ministerial meeting of the North Atlantic Council held at NATO Headquarters, Brussels, 12 April 1999. Available at <http://www.nato.int/docu/pr/1999/p99-051e.htm> (accessed 19 FEB 2006).
- Pape, Robert A. "The Limits of Precision-Guided Air Power." *Security Studies* 7, no. 2 (Winter 1997/98): 93-114.
- Pape, Robert A. "The True Worth of Air Power." *Foreign Affairs* 83, no. 2 (March/April 2004): 116-130.

- Pape, Robert A. "The Wrong Battle Plan." *Washington Post*, 19 October 2001.
- Pape, Robert A. *Bombing to Win: Air Power and Coercion in War*. Ithaca, NY: Cornell University Press, 1996.
- Roos, John G. "Turning Up The Heat: Taliban Became Firm Believers In Effects-Based Operations." *Armed Forces Journal International*, February 2002: 36-42.
- Rosegrant, Susan. *Getting to Dayton: Negotiating an End to the War in Bosnia*. Case Study 1356. Cambridge, MA: John F. Kennedy School of Government, 1996.
- Rumsfeld, Donald H. *Annual Report to the President and the Congress 2002*. Available at <http://www.defenselink.mil/execsec/adr2002/> (accessed 19 FEB 2006).
- Shy, John. "Jomini." in *Makers of Modern Strategy: From Machiavelli to the Nuclear Age*. Edited by Peter Paret, with the collaboration of Gordon A. Craig and Felix Gilbert. Princeton, NJ: Princeton University Press, 1986: 143-185.
- Sine, Jack. "Defining the "Precise Weapon" in Effects-Based Terms." *Air and Space Power Journal*, Spring 2006: 81-88.
- Tripp, Robert S., Kristin F. Lynch, John G. Drew, and Edward W. Chan. *Lessons From Operation Enduring Freedom*. Arlington, VA: RAND, 2004.
- Vego, Milan. "What Can We Learn from Enduring Freedom?" *Naval Institute Proceedings Magazine*, July 2002: 28-33. Accessed through the EBSCOhost database, also available at: <http://www.usni.org/Proceedings/Articles02/PROvego07.htm>
- Warden, John A. III. "The Enemy as a System." *Airpower Journal*, Spring 1995: 40-55. Accessed through the EBSCOhost database, also available at: <http://www.airpower.maxwell.af.mil/airchronicles/apj/warden.html>
- Warden, John A. III. *The Air Campaign: Planning for Combat*. Washington, DC: National Defense University Press, 1998.
- Woodward, Bob. *Bush At War*. New York, N.Y.: Simon & Schuster, 2002.
- Wrage, Stephen D. *Immaculate Warfare: Participants Reflect on the Air Campaigns over Kosovo and Afghanistan*. Edited by Stephen D. Wrage. Westport, CT: Praeger Publishers, 2003.